

## APPENDIX B

## **STATEMENT OF WORK**

### **Island Chemical Superfund Site St. Croix, U.S. Virgin Islands**

#### **I. WORK TO BE PERFORMED**

The objectives of the work (hereinafter “Work” as defined in Section IV of the Consent Decree to which this Statement of Work is attached) to be conducted at the Island Chemical Superfund Site (Site) are to:

- Mitigate the toxicity, mobility, and/or volume of volatile organic compounds (VOCs) (ethylbenzene and xylene) in soils in the Above-ground Storage Tank (AST) area so as to minimize continued leaching to groundwater;
- Mitigate the toxicity, mobility, and/or volume of VOCs (mainly ethylbenzene and xylene) in groundwater in the AST area and downgradient so as to achieve maximum contaminant levels (MCLs) and protect potential future groundwater users;
- Mitigate the toxicity, mobility, and/or volume of chloroform in groundwater in the Former Process Pit (FPP) area and downgradient so as to achieve MCLs and protect future potential groundwater users; and
- Restrict on-Site groundwater use to non-potable purposes until the water quality is restored to MCLs.

These objectives are expected to be met through the implementation of the remedy selected in the Environmental Protection Agency’s (EPA’s) August **13,2002** Record of Decision (ROD) for the Site, attached as Appendix A to the Consent Decree. The major components of the selected remedy include the following Remedial Work Elements:

#### **Remedial Work Element I - Soil Vapor Extraction/Air Sparging (SVE/AS) for the AST Area**

- The existing SVE/AS system will be used (and may be expanded to the extent necessary) to actively treat the entire volume of: 1) contaminated groundwater exceeding MCLs and 2) contaminated soils exceeding soil screening levels (SSLs). Air sparging will be used to **strip** VOCs from groundwater and enhance biodegradation, and soil vapor extraction will be used to recover sparged VOC vapors and to remove VOCs from the unsaturated zone soils.
- SVE/AS system performance monitoring will be required throughout the duration of the system operation and maintenance to verify and monitor treatment system performance and to assess remedial progress, as approved by EPA.

- SVE/AS system operation will continue to operate until EPA's SSLs and groundwater MCLs are achieved as specified herein. It is anticipated that SSLs and MCLs will be achieved in less than five years based on past performance of the pilot system.
- Air discharge criteria and compliance monitoring will be in accordance with federal and territorial requirements.
- Achievement of SSLs will be verified by collecting confirmatory soil samples across the impacted area. Sampling will be performed using an appropriate grid system, with samples collected at appropriate depth intervals to the water table at each grid node within the contaminated area. Samples will be analyzed for ethylbenzene and xylene.
- Long-term groundwater monitoring and reporting will be initially performed on a quarterly basis. Groundwater samples will be collected for VOCs analysis, and field measurements will be taken for water quality parameters (*i.e.*, dissolved oxygen, conductivity, temperature, pH, and oxidation reduction potential) at MW-1, MW-6, MW-8, MW-10, and at up to three additional locations using existing monitoring wells at locations approved by EPA. Water level measurements will be taken at all existing monitoring wells/points. The frequency of long-term monitoring will be subjected to annual review and may be modified, as approved by EPA. Long-term groundwater monitoring will continue to ensure the groundwater quality achieves MCLs.
- Groundwater extraction and treatment has been retained as a contingency remedy for this area, which will be implemented in the future, if warranted based upon monitoring results. The decision to implement the contingency remedy will be based upon evidence (*e.g.*, statistical analysis, modeling) that the VOC plume is being remediated at rates that are significantly less than feasibility study predictions and that are less than cleanup rates that could otherwise be achieved by the contingency remedy.

#### Remedial Work Element II - Monitored Natural Attenuation (MNA) for the FPP Area

- Long-term groundwater monitoring and reporting will be initially performed on a quarterly basis. Groundwater samples will be collected for VOCs analysis, and field measurements will be taken for water quality parameters at MW-2, MW-7, MW-11, MW-13, and at up to three additional existing monitoring wells approved by EPA. In addition, samples will be collected for analysis of intrinsic biodegradation parameters (*e.g.*, total organic carbon, nitrate, sulfate, ferrous iron, dissolved oxygen, sulfide, and methane) at MW-2, MW-11, and at least two other well locations approved by EPA. Water level measurements will be taken at all existing monitoring wells/points. The frequency of long-term monitoring will be subjected to annual review and may be modified, as approved by EPA. Long-term groundwater monitoring will continue to ensure the groundwater quality achieves MCLs.
- The environmental monitoring results from the FPP area will be used to confirm that the VOC plume is attenuating and that its leading edge is not advancing downgradient.

Downgradient monitoring wells, will be used to track VOC concentrations and any exceedances of MCLs. The monitoring results will also be compared against feasibility study estimates regarding natural attenuation rates, with the results of updated trend analyses included as part of quarterly remedial progress reports.

- Groundwater extraction and treatment has been retained as a contingency remedy for this area, which will be implemented in the future, if warranted based upon monitoring results. The decision to implement the contingency remedy will be based upon evidence (e.g., statistical analysis, modeling) that the VOC plume is attenuating at rates that are significantly less than feasibility study predictions and that are less than cleanup rates that could otherwise be achieved by the contingency remedy.

### Remedial Work Element III- Institutional Controls

The Virgin Islands Department of Planning and Natural Resources (DPNR), in consultation with EPA and, as appropriate, the Settling Parties, will utilize institutional controls (in the form of existing well permitting laws and regulations) to limit the pumping of groundwater at the Site to prevent interference with the selected remedy and to also prevent human exposure to contaminated groundwater until MCLs are achieved.

Institutional controls shall be monitored and maintained to: 1) prevent human ingestion of ground water containing concentration of VOCs in excess of the performance standards for drinking water; and 2) restrict withdrawal of ground water within the vicinity of the plume that could adversely impact the ground water remedy.

## **11. PERFORMANCE STANDARDS**

Performance Standards are the cleanup standards and other measures to achieve the goals of the Remedial Action.

The remedy shall comply with all Applicable or Relevant and Appropriate Requirements (ARARs) and other criteria to be considered (TBCs) as set forth herein and in the ROD. Accordingly, the remedy will reduce the risk to human health and the environment at the Site.

The Site groundwater quality will be restored to federal **MCLs** for drinking water (**40 CFR Part 141**), and the impacted subsurface soils will be restored to EPA SSLs (which are TBCs set forth in Table 13 of the ROD) for protection of groundwater quality. The SVE/AS system will operate in accordance with national emissions standards for hazardous air pollutants (NESHAPS; **40 CFR Part 161**) and territorial air pollution control requirements (VIC, Title 12, Chapter 9). Well installation and abandonment will be performed in accordance with Territorial requirements (VIC Title 12, Chapter **5**).

**111. PROJECT SUPERVISION/MANAGEMENT, PROJECT COORDINATION**

All Work at or relating to the Site shall be performed under the direction and supervision of a qualified, licensed professional engineer or engineering firm with a licensed professional engineer on staff (hereinafter, Supervising Contractor) and will meet any and all requirements of applicable federal, Territorial, and other local laws. Within ten (10) days of the lodging of the Consent Decree, the Settling Defendants shall notify EPA and DPNR, in writing, of the names, titles, and qualifications of all contractors and subcontractors proposed to be used in the development and implementation of the work to be performed. Selection of any such engineer, contractor, or subcontractor shall be subject to written approval by EPA.

**IV. TASKS NECESSARY TO IMPLEMENT REMEDIAL WORK ELEMENTS I, II AND III**

**A. Remedial Work Elements I and II**

1. Within thirty (30) days of lodging of the Consent Decree, Settling Defendants shall submit:
  - a. A plan for the performance of groundwater monitoring at the AST area, as necessary, to support remedial progress evaluations and decisions related to the periodic refinement of treatment system operational settings for optimization purposes until the soil and groundwater Performance Standards have been achieved. Groundwater monitoring requirements should also be included for the post-treatment verification period following SVE/AS system shutdown.
  - b. A plan for the performance of confirmatory soil sampling in the AST area to verify the soil Performance Standards have been achieved.
  - c. A plan for the performance of groundwater monitoring in the FPP area to support remedial progress evaluations related to MNA until the groundwater Performance Standards have been achieved.
2. EPA will either approve the plans identified in paragraph A.1.a-c. above, or will require modification(s) of any or all of the plans, in accordance with the procedures set forth in the Consent Decree.
3. Upon EPA's approval of the plans, Settling Defendants shall continue to perform Remedial Work Elements I and II activities in accordance with the approved documents.

B. Remedial Work Element III

1. Within thirty (**30**) days of lodging of the Consent Decree, Settling Defendants shall submit to EPA an Operation & Maintenance (O&M) Plan for Remedial Work Element III (Institutional Controls). The O&M Plan for Remedial Work Element III shall conform to EPA guidelines contained in ***Considerations for Preparation of Operation and Maintenance Manual***, EPA 68-01-0341 and shall provide for the following:
  - a. a plan for monitoring and maintaining institutional controls;
  - b. a sample monitoring report; and
  - c. a schedule for periodic reporting of the results **of** the monitoring, including submittal of an annual report and a summary report no less often than once every five (**5**) years.
2. EPA will either approve the O&M Plan for Remedial Work Element III or will require modification of it, in accordance with the procedures set forth in the Consent Decree.
3. Upon EPA's approval of the O&M Plan for Remedial Work Element III, Settling Defendants shall perform the O&M activities in accordance with the approved document.

V. **REMEDIAL ACTION REPORT FOR REMEDIAL WORK ELEMENTS I, II AND III**

- A. **An** SVE/AS system for Remedial Work Element I and the environmental monitoring system for Remedial Work Elements I and II are already in place. Settling Defendants shall submit written Notification of Remedial Action ("RA") Completion to EPA upon Settling Defendants' determination that the RA work for Remedial Work Elements I, II, and III has been completed, and the Performance Standards set forth herein and in the ROD have been attained.
- B. Settling Defendants shall schedule and conduct a final inspection for Remedial Work Elements I and II within forty-five (45) days after Settling Defendants submit their Notification of RA Completion to EPA, to be attended by Settling Defendants, EPA, DPNR, and/or their respective representatives. The final inspection will consist of a visual Site inspection to determine the completeness of Remedial Work Elements I and II **and** their consistency with the ROD and the Consent Decree. If EPA requires corrective measures, Settling Defendants shall undertake the corrective measures according to a schedule approved by EPA. Within fourteen (14) days after completion of the corrective measures, Settling Defendants shall submit written notification and supporting documentation to EPA and DPNR and, if requested by EPA, shall be available to accompany EPA, DPNR, and/or their representatives on a followup inspection.

- C. Within ninety (90) days after Settling Defendants' Notification of RA Completion, Settling Defendants shall submit a Remedial Action Report for Remedial Work Elements I, II and III to EPA and DPNR. The Remedial Action Report shall be prepared in accordance with the EPA *Closeout Procedures for National Priorities List Sites*, EPA 540-R-98-016, OSWER Directive 9320.2-09A-P, dated January 2000. The RA Report shall also include all health & safety, quality assurance/quality control, and operation & maintenance plans that have been previously submitted to EPA as well as a certification by a professional engineer licensed by the Territory or by a responsible corporate official of Settling Defendants that the remedy has been constructed and implemented in compliance with the requirements and intent of the ROD and this Consent Decree.
- D. EPA will either approve the RA Report or will require that it be modified in accordance with the procedures set forth in the Consent Decree.

**VI. SUPPLEMENTAL REMEDIAL DESIGN (RD), REMEDIAL ACTION, AND O&M FOR REMEDIAL WORK ELEMENTS I & II**

Supplemental activities associated with the potential expansion of the existing SVE/AS system and the addition of groundwater monitoring wells may be required to achieve Performance Standards based on EPA's evaluation of existing monitoring data. EPA will notify Settling Defendants if supplemental activities are required. In the event that supplemental activities are required, Settling Defendants shall perform some or all of the following tasks as determined by EPA in its sole discretion:

A. Remedial Design Work Plan

Within thirty (30) days of receipt of EPA's notice, Settling Defendants shall submit a Remedial Design Work Plan that shall provide for the collection of all data needed for performing the necessary RD activities.

The Work Plan shall comply with CERCLA and relevant EPA guidance, including the EPA document entitled *Guidance on Oversight of Remedial Designs and Remedial Actions performed by Potentially Responsible Parties*, (OSWER directive 9355.5-01, EPA/540/g-90-001), dated April 1990 and shall be in conformance, *inter alia*, with the *Superfund Remedial Design and Remedial Action Guidance*, dated June 1986, as well as other EPA guidance documents.

The Remedial Design Work Plan shall include plans and schedules for implementation of pre-RD and RD tasks, and shall include, but not be limited to, the following items:

1. Quality Assurance Project Plan

A Quality Assurance Project Plan (QAPP) or update to the existing QAPP, as necessary, shall be prepared consistent with *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations*, (EPA QA/R-5,

March 2001), and Guidance on Conducting Quality Assurance Project Plans (EPA QA/G-5 dated February 1998), and subsequent amendments to such guidelines upon notification by EPA to Settling Defendants of such amendment. Amended guidelines shall apply only to procedures conducted after such notification. The QAPP shall include the following elements:

- a. A detailed description of the sampling, analysis, and monitoring that shall be performed during the RD phase, consistent with this SOW, the ROD, and the Consent Decree. The QAPP shall provide a plan for the performance of air monitoring, **as** necessary, to ensure that any air emissions during the RD phase meet applicable or relevant and appropriate air emission requirements; and
- b. All sampling, analysis, data assessment, and monitoring shall be performed in accordance with the guidance provided in the Region II Quality Assurance (QA) Homepage <http://www.epa.gov/region02/desa/hsr/sops.htm>, or an alternate EPA-approved test method, and the guidelines set forth in the Consent Decree. All testing methods and procedures shall be fully documented and referenced to established methods or standards.
- c. The QAPP shall also specifically include the following items:
  - i. **An** explanation of the way(s) the sampling, analysis, and monitoring will produce data for the RD phase;
  - ii. A detailed description of the sampling, analysis, and testing to be performed, including sampling methods, analytical and testing methods, sampling locations and frequency of sampling;
  - iii. A map depicting sampling locations; and,
  - iv. A schedule for performance of specific tasks.
- d. In the event that additional sampling locations and analyses are utilized or required, Settling Defendants shall submit to the EPA an addendum to the QAPP for approval **by** EPA.
- e. The QAPP shall contain the following elements:

### **Project Management**

- i. Title and Approval Sheet
- ii. Table of Contents and Document Control Format
- iii. Distribution List
- iv. Project/Task Organization and Schedule



- v. Problem Definition/Background
- vi. Project/Task Description
- vii. Quality Objectives and Criteria for Measurement Data
- viii. Special Training Requirements/Certification
- ix. Documentation and Records

### **Data Generation and Acquisition**

- x. Sampling Process Design
- xi. Sampling Methods Requirements
- xii. Sample Handling and Custody Requirements
- xiii. Analytical Methods Requirements
- xiv. Quality Control Requirements
- xv. Instrument/Equipment Testing, Inspection, and Maintenance Requirements
- xvi. Instrument Calibration and Frequency
- xvii. Inspection/Acceptance Requirements for Supplies and Consumables
- xviii. Data Acquisition Requirements (Non-Direct Measurements)
- xix. Data Management

### **Assessment/Oversight**

- xx. Assessments and Response Actions
- xxi. Reports to Management

### **Data Validation and Usability**

- xxii. Data Review, Validation, and Verification Requirements
- xxiii. Validation and Verification Methods
- xxiv. Reconciliation with Data Quality Objectives

f. In order to provide quality assurance and maintain quality control with respect to all samples to be collected, Settling Defendants shall ensure the following:

- i. Quality assurance and chain-of-custody procedures shall be performed in accordance with standard EPA protocol and guidance, as provided in the Region 2 QA Homepage, and the guidelines set forth in the Consent Decree.
- ii. The laboratory to be used must be specified. If the laboratory participates in the Contract Laboratory Program (CLP) or maintains an equivalent State certification for the analysis to be performed for this investigation, then project specific Performance

Evaluation (PE) samples will not be required, as CLP laboratories run EPA PEs on a quarterly basis. If the proposed laboratory does not participate in the **CLP** or maintain an equivalent State certification for the analyses required, PE samples must be analyzed to demonstrate the capability to conduct the required analysis prior to being approved for use. Once a non-CLP laboratory has been selected, the laboratory should submit a copy of their Laboratory Quality Assurance Program Plan to the EPA for review and approval. In addition, the laboratory shall submit current copies (within the past six months) of a laboratory certification as provided from either a State or Federal agency which conducts such certifications. The certification shall be applicable to the matrix/analyses which are to be conducted.

iii. For any analytical work performed, including that done in a fixed laboratory, in a mobile laboratory, or in on-Site screening analyses, Settling Defendants must submit to the EPA a "Non-CLP Superfund Analytical Services Tracking System" form for each non-CLP laboratory utilized during a sampling event, within thirty **(30)** days after acceptance of the analytical results. Upon completion, such documents shall be submitted to the EPA Project Coordinator, with a copy of the form and transmittal letter to:

Regional Sample Control Center Coordinator  
EPA Region 2  
Division of Environmental Science & Assessment  
2890 Woodbridge Avenue, Bldg. 209, MS-215  
Edison, NJ 08837

iv. The laboratory utilized for analyses of samples must perform all analyses according to accepted EPA methods as documented in the *Contract Lab Program Statement of Work for Organic Analysis*, (OLM04.2) or the latest revision, and the *Contract Lab Program Statement of Work for Inorganic Analysis*, (ILM04.0) or the latest revision, or other EPA approved methods.

v. Unless indicated otherwise in the approved QAPP, all data will be validated upon receipt ~~from~~ the laboratory.

vi. Submission of the validation package (checklist, report, and Form I containing the final data) to EPA, prepared in accordance with the provisions of Subparagraph vii, below.

vii. Assurance that all analytical data that are validated as required by the QAPP are validated according to the procedures stated in the *EPA Region II Contract Lab Program Organics Data Review and*

*Preliminary Review* (SOP #HW-6, Revision 12), dated March 2001, or the latest revision, and the *Evaluation of Metals Data for the Contract Laboratory Program* (SOP #HW-2, Revision 11), dated January 1992 or the latest revision, or EPA-approved equivalent procedures. Region 2 Standard Operating Procedures are available at: <http://www.epa.gov/region02/desa/hsw/sops.htm>.

viii. Unless indicated otherwise in the approved QAPP, Settling Defendants shall require deliverables equivalent to CLP data packages **from** the laboratory for analytical data. Upon the EPA's request, Settling Defendants shall submit to the EPA the **full** documentation (including raw data) for this analytical data. The EPA reserves the right to perform an independent data validation, data validation check, or qualification check on generated data.

ix. Settling Defendants shall insert a provision in their contract(s) with the laboratory utilized for analyses of samples, which will require that the laboratory grant access to EPA personnel and authorized representatives of the EPA for the purpose of ensuring the accuracy of laboratory results related to the Site.

x. Upon request, Settling Defendants shall allow split or duplicate samples to be taken by EPA and the Territory or their authorized representatives. Settling Defendants shall notify EPA not less than **28** days in advance of any sample collection activity unless shorter notice is agreed to by EPA. In addition, EPA shall have the right to take any additional samples that EPA deems necessary. Upon request, EPA shall allow Settling Defendants to take split or duplicate samples of any samples it takes as part of EPA's oversight of the Settling Defendants' implementation of the Work.

xi. Settling Defendants shall submit to EPA three (**3**) copies of the results of all sampling and/or tests or other data obtained or generated by or on behalf of Settling Defendants with respect to the Site and/or the implementation of the Consent Decree and/or **SOW** within twenty (**20**) days of the date when those results or data become available to Settling Defendants, unless EPA agrees otherwise.

## **2. Health and Safety Contingency Plan**

A Health and Safety Contingency Plan (HSCP) or update to the existing HSCP, as necessary, for all activities performed under the Consent Decree shall be developed by Settling Defendants to address the protection of public health and safety and the response to contingencies that could impact public health, safety, and the environment. The HSCP shall satisfy

the requirements of the *Occupational Safety and Health Guidance for Hazardous Waste Site Activities*, (June 1990, DHHS NIOSH Publication No. 90-117), and the Occupational Safety and Health Administration, U.S. Department of Labor (OSHA) requirements cited below:

- a. All Site activities shall be performed in such a manner as to ensure the safety and health of personnel so engaged. All Site activities shall be conducted in accordance with all pertinent general industry (29 CFR Part 1910) and construction (29 CFR Part 1926) OSHA standards, and EPA's *Standards Operating Safety Guides* (OSWER, 1988), as well as any other applicable Territory and municipal codes or ordinances. All Site activities shall comply with those requirements set forth in OSHA's final rule entitled *Hazardous Waste Operations and Emergency Response*, 29 CFR § 1910.120, Subpart H.
- b. The HSCP shall include, at a minimum, the following items as appropriate:
  - i. Plans showing the location and layout of any temporary facilities to be constructed on or near the Site;
  - ii. Description of the known hazards and evaluation of the risks associated with the Site and the potential health impacts related to the Site activities;
  - iii. List of key personnel and alternates responsible for Site safety, response operations, and protection of the public;
  - iv. Description of levels of protection (based on specified standards) to be utilized by all personnel;
  - v. Delineation of work, decontamination, and safe zones, and definitions of the movement of zones;
  - vi. Description of decontamination procedures for personnel and equipment, and handling and removal of disposable clothing or equipment;
  - vii. Incidental emergency procedures which address emergency care for personnel injuries and exposure problems, and containment measures. These procedures shall include evacuation routes, internal and external communications procedures for response to fire, explosion, or other emergencies, the name of the nearest hospital and the route to that hospital. Local agencies with the capability to respond to emergencies shall be identified and their

capabilities shall be described. A description of the procedures for informing the community of these measures shall be outlined;

viii. Description of the personnel medical surveillance program in effect;

ix. Description of monitoring for personnel safety;

x. Description of routine and special personnel training programs; and

xi. Description of an air monitoring program to determine concentrations of airborne contaminants to which workers on-Site and persons near the Site boundary may be exposed. The results of work-zone air monitoring may be used as a trigger for implementing Site-boundary air monitoring.

### 3. Description of Remedial Design Tasks

The Remedial Design Work Plan shall include a detailed description of all other RD tasks to be performed, along with a schedule for performance of those tasks. Such tasks shall include, at a minimum, the preparation of the RD Reports required by Section VI C. below, and tasks necessary to ensure compliance with ARARs, as outlined herein and in the ROD. The Remedial Design Work Plan shall include an outline of the requirements of the RD Reports.

#### a. RD Schedules, Draft Schedule for Remedial Action, O&M, and Monitoring

The Remedial Design Work Plan shall include a schedule covering all pre-RD and RD activities, including but not limited to, the submittal of the RD Reports listed in Section VI C., below. The Remedial Design Work Plan shall **also** include a draft schedule for remedial action (RA) and monitoring activities. The schedule shall be in the form of a task/subtask activity bar chart or critical path method sequence of events.

b. During preparation of the Remedial Design, Settling Defendants may identify and request EPA approval for changes to the Remedial Design Work Plan or other previously approved plans regarding design of Remedial Work Elements I or II. EPA will either approve, disapprove, or require modification of any requests **in** accordance with the procedures set forth in the Consent Decree.

- c. The draft schedule for RA and monitoring activities may be revised during the remedial process, subject to EPA's approval.
- d. The RD schedule shall provide for the completion and submittal to EPA of the Final Design Report within one hundred eighty (180) days of EPA's written notification of approval of the Remedial Design Work Plan, unless otherwise approved by EPA.
- e. The draft schedule for the RA shall provide for the completion of the construction of Remedial Work Element I within sixty (**60**) days of EPA approval of the RA Work Plan, unless otherwise approved by EPA.

B. Approval of Remedial Design Work Plan

EPA will either approve the Remedial Design Work Plan, or will require modification of such plan, in accordance with the procedures set forth in the Consent Decree. Settling Defendants shall implement the EPA-approved Remedial Design Work Plan in accordance with the schedules contained therein.

C. Remedial Design

Settling Defendants shall perform the pre-RD and RD activities in conformance with the Remedial Design Work Plan approved by EPA and within the time frames specified in the RD schedule contained therein. Unless otherwise approved by EPA, the RD shall include the preparation of Preliminary (**35%** completion), Pre-final (95% completion), and Final RD Reports (100% completion).. Where appropriate, the RD may incorporate previous submissions of designs and plans as approved by EPA.

1. Preliminary, Pre-Final, and Final RD Reports

The reports shall be submitted to EPA and DPNR in accordance with the schedule set forth in the approved Remedial Design Work Plan. The RD reports shall include a discussion of the design criteria and objectives, with emphasis on the capacity and ability to meet design objectives successfully. The reports shall also include the plans and specifications that have been developed at that point in time, along with a design analysis. The design analysis shall provide the rationale for the plans and specifications, including results of all sampling and testing performed, supporting calculations and documentation of how these plans and specifications will meet the requirements of the ROD and shall provide a discussion of any impacts these findings may have on the RD. The design reports shall also include the following items, as appropriate:

- a. A technical specification for photographic documentation of the remedial construction work;
- b. A discussion of the manner in which the RA will achieve the Performance Standards;
- c. A draft schedule for remedial action activities, and a preliminary schedule *for* operation and maintenance (O&M) *and* monitoring activities.

## 2. Additional Intermediate RD Report Reauirements

The Preliminary RD Report (35% completion) shall include, as appropriate:

- a. Preliminary drawings showing general arrangement of all work proposed;
- b. A discussion of the manner in which the pre-design components for the Remedial Action will be considered;
- c. Draft Piping & Instrumentation diagrams, as necessary, showing all equipment and control systems;
- d. Table of Contents for the specifications, including a listing of items from the Construction Specifications Institute master format that are expected to be included in the construction specifications. This master format is presented in the Construction Specifications Institute's *Manual & Practice*, 1985 edition, available from the Construction Specifications Institute, 601 Madison Street, Alexandria, Virginia 22314;
- e. Engineering plans representing an accurate identification of existing Site conditions and an illustration of the work proposed. Typical items to be provided on such drawings include, at a minimum, the following:
  - i. Title sheet including at least the title of the project, a key map, the name of the designer, date prepared, sheet index, and EPA/DPNR *Project* identification;
  - ii. All property data including owners of record for all properties within 200 feet of the Site;
  - iii. A Site survey including the distance and bearing of all property lines that identify and define the project Site;
  - iv. All easements, rights-of-way, and reservations;
  - v. All buildings, structures, wells, facilities, and equipment (existing and proposed) if any;

- vi. A topographic survey, including existing and proposed contours and spot elevations for all areas that will be affected by the remedial activities, based on **U.S. Coast** and Geodetic Survey data;
  - vii. All utilities, existing and proposed;
  - viii. Location and identification of all significant natural features including, *inter alia*, wooded areas, water courses, wetlands, flood hazard areas, and depressions;
  - ix. Flood hazard data and 100-year and 500-year flood plain delineation;
  - x. North arrow, scale, sheet numbers and the person responsible for preparing each sheet;
  - xi. Decontamination areas, staging areas, borrow areas and stockpiling areas;
  - xii. Miscellaneous detail sheets;
  - xiii. Definitions of all symbols and abbreviations; and,
  - xiv. A specification for a sign at the site, stating that the project is being performed under EPA oversight, and providing an **EPA** telephone number for further information.
- f. Survey work that is appropriately marked, recorded and interpreted for mapping, property easements and design completion;
  - g. Drawings of all proposed equipment, improvements, details and all other construction and installation items to be developed in accordance with the current standards and guidelines. Drawings shall be of standard size, approximately **24" x 36"**. A list of drawing sheet titles will be provided;
  - h. Engineering plans indicating, at a minimum, the following:
    - i. Site security measures;
    - ii. Roadways; and,
    - iii. Electrical, mechanical, structural, and **HVAC** drawings, if required.
  - 1. Any value engineering proposals.



3. Additional Pre-Final/Final RD Report Requirements

The Pre-final and Final RD Report shall also include:

- a. Final plans and specifications;
- b. **An** O&M Plan or update to the existing O&M Plan, as necessary. The O&M Plan shall be prepared in accordance with the ***Superfund RD and RA Guidance***, dated September 1986, OSWER Directive 9355.0-4A. The O&M Plan shall include, but need not be limited to, the following:
  - i. a description of the personnel requirements, responsibilities, and duties, including a discussion for training, lines of authority;
  - ii. a description of all sampling, analysis, and monitoring to be conducted; and
  - iii. a description of all O&M and monitoring requirements.
- c. A Construction Quality Assurance Project Plan (CQAPP), which shall detail the approach to quality assurance during construction activities at the Site, shall specify a quality assurance official (QA Official), independent of the contractor that performs the RA, to conduct a quality assurance program during the construction phase of the project. The CQAPP shall address sampling, analysis, and monitoring to be performed during the remedial construction phase of the Work. Quality assurance items to be addressed include, at a minimum, the following:
  - i. Inspection and certification of the Work;
  - ii. Measurement and daily logging;
  - iii. Field performance and testing;
  - iv. As-built drawings and logs;
  - v. Testing of the Work to establish whether the design specifications are attained; and,
  - vi. Testing methods appropriate to remedial construction including, at a minimum, testing of remedial construction materials, as necessary, prior to use, and testing of constructed remedial components to ensure that they meet design specifications.
- d. A report describing those efforts made to secure access and obtain other approvals and the results of those efforts (see Section VI. C., above).

- e. A final engineer's construction cost estimate, which may be provided under separate cover concurrent with submittal of the Final RD Report.
- f. A plan for implementation of construction and construction oversight.
- g. A method for selection of the construction contractor(s).
- h. A proposed schedule for implementing all of the above.

D. Approval of RD Reports

- 1. EPA will either approve each of the RD Reports or will require modification of such reports in accordance with the procedures set forth in the Consent Decree.
- 2. Changes required by EPA's comments on the Preliminary RD Report shall be made in the pre-Final RD Report. Changes required by EPA's comments on the pre-Final RD Report shall be made in the Final RD Report.
- 3. EPA will either approve the Final RD Report or require modification of each, in accordance with the procedures set forth in the Consent Decree.

E. Remedial Action Work Plan

- 1. Within thirty (30) days of the date on which Settling Defendants receive written notification from EPA of the approval of the Final RD Report, Settling Defendants shall submit a detailed RA Work Plan. The RA Work Plan shall comply with CERCLA and relevant EPA guidance, including the EPA document entitled *Guidance on Oversight of Remedial Designs and Remedial Actions performed by Potentially Responsible Parties*, (OSWER directive 9355.5-01, EPA/540/g-90-001), dated April 1990 and shall be in conformance, *inter alia*, with the *Superfund Remedial Design and Remedial Action Guidance*, dated June 1986, as well as other EPA guidance documents.
- 2. The RA Work Plan shall include, but not be limited to, the following items:
  - a. Site Management Plan (SMP) - The SMP shall include, at a minimum, the following items:
    - 1. Identification of the RA Project Team (including, but not limited to the RA Contractor).

- ii. A final schedule for the completion of RA construction, operation and maintenance, and environmental monitoring tasks, as well as a schedule for completion of required plans and other deliverables.
- iii. Methodology for implementation of the RA construction and the Quality Assurance Plan (see Section E.2.b, below).
- iv. Methodology for implementation of the O&M Plan (see Section E.2.d, below).
- v. Procedures and plans for the decontamination of construction equipment and the disposal of contaminated materials.
- vi. Methods for satisfying permitting requirements.
- vii. Discussion of the methods by which construction operations shall proceed. Discussion shall include the following:
  - Timing of and manner in which activities shall be sequenced;
  - Preparation of the Site including security, utilities, decontamination facilities, construction trailers, and equipment storage;
  - Coordination of construction activities;
  - Site maintenance during the RA;
  - Coordination with local authorities regarding contingency planning and potential traffic obstruction; and
  - Entry and access to the Site during the construction period(s) and periods of inactivity, including provisions for decontamination, erosion control, and dust control.
- viii. Discussion of construction quality control, including:
  - Methods of performing the quality control inspections, including when inspections should be made and what to look for;

- Control testing procedures for each specific test. This includes information which authenticates that personnel and laboratories performing the tests are qualified and the equipment and procedures to be used comply with applicable standards;
  - Procedures for scheduling and managing submittals, including those of subcontractors, off-Site fabricators, suppliers, and purchasing agents; and
  - Reporting procedures including frequency of reports and report formats.
- b. Quality Assurance/Quality Control Project Plan - **An** update to the **QAPP** shall be prepared consistent with EPA ***Requirements for Quality Assurance Project Plans for Environmental Data Operations***, (EPA QA/R-5, October 1998) (see Section VI. A., above, for these requirements).
  - c. Health & Safety Plan - **An** update to the HSCP (see Section VI.A., above, for these requirements) shall be prepared. The HSCP shall address health and safety measures to be implemented and observed by construction personnel, as well as recommended health and safety measures for the adjacent community and general public, together with a description of the program for informing the community of these recommendations. The HSCP shall include the name of the person responsible in the event of **an** emergency situation, as well as the necessary procedures that must be taken in the event of **an** emergency, **as** outlined in the Consent Decree.
  - d. Operations and Maintenance (O&M) Plan - **An** update to the O&M Plan for Remedial Work Elements I and II shall be prepared. The O&M Plan shall conform to EPA guidelines contained in ***Considerations for Preparation of Operation and Maintenance Manual***, EPA 68-01-0341.

3. EPA will either approve the RA Work Plan or require that it be modified in accordance with the procedures set forth in the Consent Decree. Settling Defendants shall implement the EPA-approved RA Work Plan in accordance with the requirements and schedules contained therein.

F. Award RA Contract

Within thirty (30) days of the approval of the RA Work Plan by EPA, Settling Defendants shall award the RA Contract(s) to complete the RA construction work and to perform O&M.

G. Remedial Construction

1. Within sixty (**60**) days of EPA's written approval of the RA Work Plan, Settling Defendants shall initiate RA construction in accordance with the approved RA Work Plan and the schedules and requirements contained therein.
2. During the performance of RA construction, Settling Defendants may identify and request EPA approval for field changes to the RA Work Plan. EPA will either approve, disapprove, or require modifications to any requests for field changes in accordance with the procedures set forth in the Consent Decree.
3. Notice of Construction Completion - Settling Defendants shall provide notification to EPA and DPNR at least fourteen (**14**) days prior to the completion of RA construction work.

4. Pre-Final Inspection

- a. Settling Defendants and their RA contractor(s) shall conduct a pre-final inspection which will be attended by EPA, DPNR, and/or its representatives. The pre-final inspection shall consist of a visual inspection of the Site to determine the completeness of the RA construction work in accordance the approved RA Work Plan, the Consent Decree, the ROD and applicable federal and territorial laws, rules, and regulations.
- b. Following the pre-final inspection, EPA will either determine that construction is complete or specify the necessary corrective measures to the construction phase of the Remedial Action, as appropriate. If EPA requires corrective measures, Settling Defendants shall undertake the corrective measures according to a schedule approved by EPA. Within fourteen (**14**) days after completion of the corrective measures, Settling Defendants shall submit written notification and supporting documentation to EPA and DPNR and, if requested by EPA, shall be available with their RA contractor(s) to accompany EPA, DPNR, and/or their representatives on a follow-up inspection.

5. Interim Remedial Action Report and Updated O&M Plan

- a. Within ~~sixty~~ (**60**) days of completing RA construction, Settling Defendants shall submit an Interim Remedial Action Report to EPA and DPNR. If directed by EPA, Settling Defendants shall also submit ~~an~~ updated O&M Plan.

- b. The Interim Remedial Action Report shall be prepared in accordance with the **EPA *Closeout Procedures for National Priority Sites***, EPA 540-R-98-016, OSWER Directive 9320.2-09A-P, dated January 2000 and shall include appropriate Interim RA results, a complete set of as-built drawings, summary of actual construction costs incurred, and contact information for the pertinent RD/RA contractors. This Interim RA Report shall also include certification by a professional engineer licensed by the Territory or by a responsible corporate officer of Settling Defendants, that the remedy has been constructed and implemented in compliance with the requirements and intent of the ROD and this Consent Decree.
- c. The O&M Plan shall be updated based upon the as-built SVE/AS treatment system and Site features.
- d. EPA will either approve the Interim RA Report and/or updated O&M Plan or will require that one or both of the documents be modified in accordance with the procedures set forth in the Consent Decree. Settling Defendants shall implement the EPA-approved O&M Plan in accordance with the requirements and schedules contained therein.

**H. Notice of \_\_\_\_\_ and Supplemental Final Remedial ti Report**

- 1. Settling Defendants shall submit written Notification of Supplemental RA Completion to EPA upon the Settling Defendants determination that the Supplemental RA work has been completed and the Performance Standards have been attained.
- 2. Settling Defendants shall schedule and conduct a final inspection for the Supplemental RA work within ~~thirty~~ **(30)** days after the Settling Defendants submits its Notification of Supplemental RA Completion to EPA, to be attended by Settling Defendants, EPA, DPNR, and/or their respective representatives. The final inspection will consist of a visual site inspection to determine the completeness of the Supplemental RA work and its consistency with the ROD and the Consent Decree. If EPA requires corrective measures, Settling Defendants shall undertake the corrective measures according to a schedule approved by EPA. Within fourteen (14) days after completion of the corrective measures, Settling Defendants shall submit written notification and supporting documentation to EPA and DPNR and, if requested by EPA, shall be available to accompany EPA, DPNR, and/or their representatives on a follow-up inspection.
- 3. Within sixty (60) days after Settling Defendants' Notification of Supplemental RA Completion, Settling Defendants shall submit a

Supplemental Remedial Action Report to EPA and DPNR. The Supplemental Remedial Action Report shall be prepared in accordance with the EPA *Closeout Procedures for National Priority Sites*, EPA 540-R-98-016, OSWER Directive 9320.2-09A-P, dated January 2000 and incorporate the approved Interim RA Report. The Supplemental RA Report shall also include all health & safety, quality assurance/quality control, and operation & maintenance **plans** that have been previously submitted to EPA **as well as** a certification by a professional engineer licensed by the Territory or by a responsible corporate official of Settling Defendants that the remedy has been constructed and implemented in compliance with the requirements and intent of the ROD and this Consent Decree.

4. EPA will either approve the Supplemental RA Report or will require that it be modified in accordance with the procedures set forth in the Consent Decree.

## **VII. LONG-TERM OPERATIONS, MAINTENANCE, AND ENVIRONMENTAL MONITORING**

- A. Settling Defendants shall perform long-term O&M and monitoring for Remedial Work Elements I, II and III in accordance with the approved RA Work Plan and O&M Plans.
- B. Goals for Soil and Groundwater Remediation
  1. The Performance Standards established for the AST area (Remedial Work Element I) and the FPP area (Remedial Work Element II) are as specified in Section 11, above.
  2. Settling Defendants shall demonstrate achievement of the soil Performance Standards in the AST area based upon the results of confirmatory soil sampling and analysis.
  3. Settling Defendants shall continue implementing the groundwater remedy including groundwater monitoring in the AST and FPP areas until the groundwater Performance Standards have been achieved for each area, **as** demonstrated by the Settling Defendants based upon a minimum of three (3) consecutive years of groundwater data which show that the groundwater meets federal MCLs for drinking water, or such shorter time period **as** approved by EPA in its sole discretion. EPA in its sole discretion shall determine whether the Performance Standards for groundwater have been reached.

## **VIII. POST REMEDIATION MONITORING (PRM) PLAN**

- A. Within sixty (**60**) days of the date that the Performance Standards specified in the

ROD and this SOW have been met for the third consecutive year (or a shorter period if approved by EPA in its sole discretion), the Settling Defendants shall submit to EPA a Post-Remediation Monitoring (PRM) Plan.

B. The PRM Plan shall include, at a minimum, the following:

1. A QAPP or update to the existing QAPP, **as** necessary, for PRM activities consistent with Section VI.A., above;
2. An HCSP or update to the existing HCSP as necessary, for PRM activities;
3. A description of work to be performed under PRM activities; and
4. A PRM schedule that identifies the frequency of monitoring and when these activities will commence.

C. EPA will either approve the PRM Plan, or require modification of it, in accordance with the procedures set forth in the Consent Decree.

#### **IX. POST-REMEDIATION MONITORING**

A. Upon EPA's approval of the PRM Plan, Settling Defendants shall commence with the PRM program for a period of three (3) years, in accordance with the PRM Plan, which includes the PRM schedule.

B. If contaminant concentrations increase above the Performance Standards (as specified in the ROD and this SOW) during post-remediation monitoring, EPA will evaluate the need, and may require the Settling Defendants to, reinstate the SVE/AS system or implement the contingency remedy.

C. Notice of Completion and Final Report for Post-Remediation Monitoring

1. Within five (5) days of the completion of post-remediation monitoring, Settling Defendants shall submit to EPA, a Notice of Completion for Post-Remediation Monitoring. The Notice of Completion for Post-Remediation Monitoring shall be signed by a licensed professional engineer meeting any and all requirements of applicable federal, Territorial, and local laws, and shall certify that the PRM activities have been completed in full satisfaction of the requirements of the Consent Decree, this **SOW**, and all plans, specifications, schedules, reports and other items developed hereunder.
2. Within sixty (60) days of the completion of post-remediation monitoring, Settling Defendants shall submit to EPA a Final Report for Post-Remediation Monitoring. The Final Report for Post-Remediation Monitoring shall summarize the Work performed under the PRM Plan and the data so generated. Deliverables under the Final Report for Post-



Remediation Monitoring shall be signed by a licensed professional engineer meeting any and all requirements of applicable federal, Territorial, and local laws, and shall certify that the PRM activities and report deliverables have been completed in full satisfaction of the requirements of the Consent Decree, this SOW, and all plans, specifications, schedules, reports and other items developed hereunder. Any modifications to the Final Report for Post-Remediation Monitoring required by EPA shall be in accordance with the procedures set forth in the Consent Decree.

3. EPA will determine whether the PRM activities or any portions(s) thereof have been completed in accordance with the standards, specifications, and reports required by this Consent Decree. If EPA determines that PRM activities have not been so completed, EPA will notify Settling Defendants in writing of those tasks which must be performed to complete the post-remediation monitoring. Settling Defendants shall then implement the specified activities and tasks in accordance with the specifications and schedules established by EPA and shall then submit a further report on the specified activities and tasks, certified by a licensed professional engineer, within thirty **(30)** days after completion of the specified activities and tasks. EPA will notify Settling Defendants in writing when PRM activities have been completed in accordance with the requirements of the Consent Decree.

#### **X. CERTIFICATION OF COMPLETION OF THE WORK**

Within forty five **(45)** days after Settling Defendants conclude that all phases of the Work required by the Consent Decree have been fully performed, Settling Defendants shall schedule and conduct a pre-certification inspection to be attended by Settling Defendants and **EPA**. If, after the pre-certification inspection, Settling Defendants still believe that the Work has been fully performed, Settling Defendants shall submit a written report by a Virgin Islands registered professional engineer stating that the Work has been completed in full satisfaction of the requirements of this Consent Decree. If, after review of the written report, EPA, after reasonable opportunity for review and comment by the Territory, determines that any portion **of** the Work has not been completed in accordance with **this** Consent Decree, EPA will notify Settling Defendants in writing of the activities that must be undertaken by Settling Defendants pursuant to this Consent Decree to complete the Work.

If EPA concludes, based on the initial or any subsequent request for Certification of Completion by Settling Defendants and after a reasonable opportunity for review and comment by the Territory, that the Work has been performed in accordance with this Consent Decree, EPA will so notify Settling Defendants in writing.

XI. CONTINGENCY REMEDY

If EPA determines, in its sole discretion, that the Contingency Remedy selected in the ROD is needed, EPA will so notify Settling Defendants and Settling Defendants shall implement the Contingency Remedy in accordance with the specifications and schedules established by EPA in the notice or otherwise approved by EPA.

## APPENDIX C



# REFERENCE

1) MAP TAKEN FROM U.S.G.S. 7.5 MINUTE QUADRANGLE OF CHRISTIANSTED, VIRGIN ISLANDS.

2000 0 2000  
scale feet

JOB No.:	003-6016	SCALE:	AS SHOWN
CAD BY:	AM	DATE:	11/07/00
CHK BY:		FILE No.:	US01-029
REV BY:		DR SUBTITLE:	03

**Golder Associates**

## SITE LOCATION MAP

VIRGIN ISLAND CHEMICAL SITE

FIGURE

1

FIGURE 1